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NURSING STUDENTS' KNOWLEDGE AND DECISIONS RELATED TO THE MANAGEMENT OF CANCER PAIN WITH NARCOTIC ANALGESICS

BY

DONNA M. ROMYN

(C)

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF NURSING

FACULTY OF NURSING

EDMONTON, ALBERTA

SPRING 1990

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Abstract

While not all patients with cancer experience pain, inadequate pain control is a common problem for those who do. Review of the literature reveals that one of the factors contributing to this problem is the failure of physicians and nurses to apply basic pharmacologic knowledge about narcotic analgesics in the management of cancer pain. Further, the literature suggests that basic nursing education has not provided nurses with the information required to effectively manage cancer pain with narcotic analgesics. The specific questions addressed in the study are: What knowledge and decisions do nursing students demonstrate related to the management of cancer pain with narcotic analgesics? and, What differences in knowledge and decisions exist among students from diploma, basic baccalaureate, and post-RN baccalaureate nursing programs? A questionnaire was utilized to assess the knowledge and decisions of a convenience sample of 164 diploma, basic baccalaureate, and post-RN baccalaureate nursing students. These nursing students were found to lack knowledge of common narcotic analgesics. No significant differences in knowledge or decisions were found in relation to program or reported number of cancer patients for whom the student had provided care. Decisions regarding the administration of narcotic analgesics in the management of cancer pain were not based on accurate knowledge. For post-RN baccalaureate students, knowledge and decisions did not improve with experience in nursing. This lack of knowledge among nursing students is of concern not only for the patient

with cancer pain, but pain of other etiology as well. Content and clinical experiences of basic nursing education programs need to be examined to determine whether or not adequate opportunities exist for nursing students to acquire the knowledge required for the effective management of cancer pain with narcotic analgesics.

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Nursing Students' Knowledge and Decisions Related To The Management of Cancer Pain with Narcotic Analgesics

by Donna M. Romyn

University of Alberta

Cancer is second only to cardiovascular disease as a cause of mortality among Canadians (Statistics Canada, 1986), and the possibility of experiencing pain is one of the most common fears faced by the patient with cancer (Hauck, 1986). A review of the literature (Appendix A) indicates that, while not all patients with cancer experience pain, inadequate pain control is a common problem for those who do.

The assessment of cancer pain is problematic because of its subjective nature and complexity (Deschamps, Band, & Coldman, 1988). It has been shown that nurses and other health caregivers frequently fail to recognize the existence of pain in hospitalized cancer patients (Donovan & Dillon, 1987). This may be related, in part, to the finding that, as pain becomes chronic, patients display less intense nonverbal behaviors (Teske, Daut, & Cleeland, 1983). In addition, nurses do not differentiate between acute and chronic pain (Watt-Watson, 1987) and frequently attribute significantly less suffering to patients with chronic pain as compared to acute pain (Burgess, 1980; Lenburg, Glass, & Davitz, 1970). This suggests that, as a result, the chronic pain of cancer patients may be undertreated. While the actual incidence of pain is unknown, the fact that cancer patients suffer pain is of concern.

Several studies have demonstrated low correspondence between

patients' self-reports of pain and physician and nurse ratings of patients' pain and between patients' self-reports of pain and the amount of analgesic administered (Camp & O'Sullivan, 1987; Cohen, 1980; Graffam, 1981; Pilowsky, Manzcap, & Bond, 1969; Teske et al., 1983). In addition, it has been found that nurses document significantly less pain than is described by patients (Camp & O'Sullivan, 1987; Fox, 1982). Fox (1982) noted that chart audits revealed a dearth of documentation of analgesic effectiveness or ineffectiveness. She suggested that sporadic changes in analgesic drugs, dosages, and frequencies in the presence of evidence of unrelieved pain were indicative of the absence of a specific plan for pain management.

Marks and Sacher (1973) found that fear of addiction was responsible for reluctance to treat the pain of terminal illness. In other subsequent studies, both physicians and nurses have been found to overestimate risks of addiction (Charap, 1978; Fox, 1982; Dorrepaal, Aaronson, & van Dam, 1989; Rankin & Snider, 1984; Weis, Sriwatanakul, Alloza, Weintraub, & Lasagna, 1983) even though the development of addiction is rare in patients with no previous history of addiction (Porter & Jick, 1980; Twycross, 1984). It has been reported that both physicians and nurses believe that patients are overmedicated rather than undermedicated (Charap, 1978) and addiction, rather than an increase in pain, is the most likely reason for a terminally ill cancer patient to request increased doses of pain medication (Charap, 1978; Fox, 1982).

In addition to ill founded concerns regarding addiction, both

physicians and nurses have been found to lack basic pharmacologic knowledge of narcotic analgesics. For example, most of the physicians and nurses in several surveys believed that narcotic analgesics differ with regard to toxicity and effects on the respiratory system even though, in reality, there is no advantage of one narcotic over another at equianalgesic doses (Charap, 1978; Fox, 1982; Watt-Watson, 1987). Many were unaware of the potentially toxic interaction of meperidine and MAO inhibitors or the beneficial interactions which may occur following the concurrent administration of narcotic analgesics and phenothiazines, and narcotic analgesics and tricyclic antidepressants (Charap, 1978; Fox, 1982; Rankin, 1982). Despite findings of earlier studies demonstrating the effectiveness of oral morphine in the management of cancer pain (Melzack, Ofiesh, & Mount, 1976; Saunders, 1976; Twycross, 1975), most physicians and nurses believed that oral morphine is ineffective as an analgesic because of poor absorption from the gastrointestinal tract (Charap, 1978; Fox, 1982).

Most physicians and nurses agree that the goal of pain management is to provide complete relief or enough relief so that the pain is not distressing (Charap, 1978; Fox, 1982; Marks & Sachar, 1973; Rankin & Snider, 1984; Watt-Watson, 1987; Weis et al., 1983). However, in one study, both underestimated effective dosage ranges (Marks & Sachar, 1973) and physicians prescribed narcotic analgesics at intervals which exceeded the pharmacologic duration of action of the drug (Charap, 1978; Fox, 1982; Marks & Sachar, 1973). In support of these findings,

Rankin (1982) found that the majority of cancer patients interviewed reported pain relief for less than 4 hours following analgesic administration. Of the medications prescribed, more than half were prescribed at intervals of 4 hours or longer, suggesting the need for larger doses or shorter intervals for better pain control.

Fox (1982) found that nurses contributed to the problem of pain management in that they tended to administer prn (administered as required) analgesics at more prolonged intervals than the ordered frequency and that, even in the presence of an order to increase the frequency of administration, there was no increase. Similarly, in a review of patients' charts, Marks and Sachar (1973) and Cohen (1980) noted that the amount of medication actually received by the patient was substantially less than what was ordered. Rankin and Snider (1984) found that, given an order for an analgesic to be administered every 3 to 4 hours prn, almost half of the nurses elected to administer the medication at 4 hour intervals. Thus, the patient would receive less analgesic than was actually permitted according to the physician's order. If a dosage range were stated, it was found that nurses tended to select the lowest dosage, even if it did not produce the desired relief of pain (Cohen, 1980; Marks & Sachar, 1973). Further, Cohen (1980) noted that nurses were not aware that, for maximum effectiveness, adequate analgesic should be given before severe pain takes hoid.

Despite evidence recommending against the prn administration of analgesics in the management of cancer pain, results of several studies

indicate that this modality of administration is common (Bruera, Fox, Chadwick, Brenneis, & MacDonald, 1987) and that 36 to 90% of physicians and nurses believe that patients should receive analgesics on a prn rather than routine basis. The prn administration of analgesics was believed to minimize the risks of addiction because medications are given only as required (Charap, 1978; Fox, 1982; Myers, 1985; Rankin & Snider, 1984). Fox (1982) reported that half of the nurses in her study believed that routine administration of analgesics would increase or escalate dosage requirements. However, in contrast, Charap (1978) found that almost all of the physicians and nurses surveyed believed that patients receiving analgesics on a routine basis would require the same or lower doses of medication.

Part of the rationale underlying the routine administration of analgesics in the management of cancer pain is prevention of the cyclic recurrence of pain and anxiety related to the anticipation of pain. Fox (1982) noted that, while most nurses recognized anxiety as a major factor influencing pain medication requirements, they failed to recognize that prn administration of analgesics will not achieve this outcome because it forces patients to experience pain and anxiety before the next dose of analgesic. As a result, analgesic requirements may escalate. Fox (1982) suggests that the prn administration of analgesics reinforces the memory of pain; whereas, routine administration may "erase" the pain memory. However, this hypothesis is not consistent with research on memory processes.

In the management of chronic unrelieved cancer pain, Charap (1978) and Fox (1982) found that 90% of physicians and nurses preferred the administration of a course of gradually increasing doses of an analgesic until a minimum effective dosage was achieved. However, while this approach is in keeping with traditional attitudes toward pain management, it may prolong the period of time that the patient is in pain. An approach thought to be more effective is to begin with a relatively high loading dose of an analgesic to alleviate the pain followed by a slow reduction in dosage to a level where adequate pain control is maintained. It is thought that the pain is thus rapidly and completely relieved (Charap, 1978; Fox, 1982; Mundinger, 1978; Twycross, 1975).

It is evident that nurses contribute, in part, to the undertreatment of cancer pain with narcotic analgesics. The literature suggests that, while basic nursing education has not provided nurses with the information required for effective cancer pain management (Brown, Johnson, & Groenwald, 1983; Graffam, 1990), education is a key factor in changing the knowledge and attitudes of nurses and improving pain control for cancer patients.

Several studies have examined the effects of inservice education and workshop programs on nurses' knowledge and attitudes about cancer pain management. In these studies, questionnaires testing such knowledge and attitudes were administered. Following participation in these programs, nurses were found to be less concerned about addiction, respiratory depression, and sedation. In addition, scores

related to knowledge of analgesic administration and attitudes toward the cancer patient in pain were found to improve significantly (Degner, Fujii, & Levitt, 1982; Hauck, 1986; Myers, 1985). However, Hauck (1986) found a weakening of the correlation between knowledge and attitude scores following participation in one of the programs suggesting that attitudes change more slowly than knowledge.

Using repeated measures, Hauck (1986) and Myers (1985) found that the observed changes in nurses' knowledge and attitudes persisted over time. Donovan and Dillon (1987) found that, in clinical settings, there was no change in the frequency with which nurses on medical and surgical units identified pain as a problem among cancer patients or in the administration of analgesics to these patients, following participation in an inservice program on the assessment and treatment of cancer pain. Thus, while positive changes in nurses' knowledge and attitude scores may occur following participation in educational programs, these changes are not necessarily reflected in actual clinical practice. This is consistent with the findings of numerous studies which indicate that there is little systematic evidence to support a significant relationship between knowledge and behavior or between attitude and behavior (Fishbein & Ajzen, 1975).

No significant relationships have been found between nurses' knowledge and attitudes and experience or level of educational preparation (Myers, 1985; Watt-Watson, 1987). However, older nurses have been found to have consistently lower knowledge scores and less

positive attitudes than younger nurses (Myers, 1985). A question which comes to mind is whether the greater knowledge and more positive attitude scores of the younger nurses reflect recent changes in nursing curricula in terms of the content included related to the management of cancer pain.

The purpose of this study is to describe the knowledge and decisions of a group of nursing students related to the management of cancer pain with narcotic analgesics. The specific questions addressed in the study are: What knowledge and decisions do nursing students demonstrate related to the management of cancer pain with narcotic analgesics? and, What differences in knowledge and decisions exist among students in diploma, basic baccalaureate, and post-RN baccalaureate nursing programs? Studies to examine the knowledge and decisions of nurses related to the management of cancer pain with narcotic analgesics are essential in determining how these factors contribute to the management of cancer pain and in planning strategies to deal with the problem of ineffective pain management (Donovan & Dillon, 1987).

Conceptual Framework

A conceptual framework describing the relationships among beliefs, attitudes, intentions, and behaviors provides the theoretical orientation for this study (Fishbein & Ajzen,1975). In this conceptual framework, it is assumed that the individual is a rational being who uses available information to make judgements, form evaluations, and arrive at decisions regarding behavior.

An individual forms beliefs and assigns certain attributes to an object based on direct observation of the object, information received about the object, and by inferences made about the object. The totality of the individual's beliefs about an object serves as the information base that ultimately determines attitudes, intentions, and behaviors toward that object.

An attitude is a learned predisposition to respond to a given object in a consistently favorable or unfavorable manner (Fishbein & Ajzen, 1975). Attitudes are evaluative in nature and are determined by the individual's beliefs that an object has certain attributes and by an evaluation of those attributes. While an attitude is a general predisposition to act in a certain way, it does not necessarily predispose the individual to perform any specific behavior. Thus, performance cannot be predicted from knowledge of the individual's attitudes. Rather, attitudes lead to a set of intentions to act in a specific way and, subsequently, may result in the actual performance of specific behaviors.

The individual's intentions to act are a function of certain beliefs: a) that performing a particular behavior will lead to certain consequences and the evaluation of those consequences, and b) that certain referents or norms suggest that the individual should or should not perform the behavior in question. These beliefs together influence the individual's attitudes and intentions and, subsequently, result in a particular behavior being performed or not performed.

In this study, this framework will be utilized to examine the knowledge

and decisions of nursing students related to the management of cancer pain with narcotic analgesics. A nursing student acquires information and assigns certain attributes to narcotic analgesics. These beliefs about narcotic analgesics contribute to an information base which influences, in part, the intent to act in a certain way. In this case, knowledge of narcotic analgesics is thought to influence, in part, the student's intent to administer narcotic analgesics in a certain manner, in a given situation. This intent will, hereafter, be referred to as a decision made in relation to the administration of narcotic analgesics in a given situation.

Decisions reflect the students' beliefs that a) the administration of narcotic analgesics will lead to desirable or undesirable consequences, and b) that certain norms suggest that narcotic analgesics should or should not be administered in a certain manner. While these decisions may provide clues about the way nursing students are likely to administer narcotic analgesics in clinical settings, actual behavior related to the administration of narcotic analgesics cannot necessarily be predicted because of other beliefs and attitudes which may be operative.

For the purpose of this study, the following definitions are to be used. Beliefs include all the information the nursing student has about narcotic analgesics. Some of these beliefs may reflect what is currently held to be probable truth about narcotic analgesics and, thereby, are considered to represent accurate knowledge. Decisions are defined as the reported intent to perform certain behaviors related to the administration of narcotic analgesics, in a given situation. A correct decision is the

reported intent to behave in a manner which has been demonstrated to contribute to the effective management of cancer pain with narcotic analgesics. Knowledge and decisions are measured by nursing students' responses to questions on a questionnaire.

Hypotheses

The hypotheses tested include:

1. nursing students will correctly identify the risks of addiction for cancer patients receiving narcotic analgesics in therapeutic dosage ranges;

2. nursing students will correctly identify potential drug interactions and the duration of action of narcotic analgesics;

3. a positive relationship will exist between nursing students' decision scores related to the management of cancer pain with narcotic analgesics and their knowledge scores regarding potential drug interactions, the risks of addiction, and the duration of action of narcotic analgesics;

4. overall knowledge and decision scores will not vary between diploma and basic baccalaureate nursing students but these students will have significantly higher knowledge and decision scores than the post-RN baccalaureate nursing students; and

5. a positive relationship will exist between the number of cancer patients cared for by the nursing students and overall knowledge and decision scores.

Method

Sample

A questionnaire was administered to a convenience sample of volunteer subjects. Subjects were from a population of approximately 300 nursing students enrolled in two diploma nursing programs, a basic baccalaureate, and a post-RN baccalaureate nursing program in a large metropolitan area. Allowing for absence from class at the time of data collection, it was anticipated that the sample would include 75 students from Diploma Program A, 55 students from Diploma Program B, 90 basic baccalaureate students (Program C), and 80 post-RN baccalaureate nursing students (Program D). To be eligible to participate in the study, subjects had to be enrolled in the final 6 months of a diploma or basic baccalaureate program or the first year of the post-RN baccalaureate program.

All subjects who met the criteria for selection into the sample and who were in class at the time of administration of the questionnaire were invited to participate. Consent to participate in the proposed study was implied by way of completion of the questionnaire. Subjects were informed that they could choose not to participate in the study with no consequence.

Ethical clearance for the proposed study was obtained from the Ethics Review Committee of the Faculty of Nursing, University of Alberta, and permission to access students was obtained from the Dean or Director of each of the participating institutions.

Materials

Data were collected using a questionnaire developed for the purposes of this study. A copy of the questionnaire can be found in Appendix B. Some of the items were developed for this study while others were derived from the literature, and from a study on a related topic (Lander, 1990). Formats for the items included checklists, open-ended questions, and semantic differential scales.

The questionnaire included items to assess nursing students' knowledge and decisions about cancer pain management with narcotic analgesics, as well as items to gather demographic data. The knowledge questions pertained to potential drug interactions, risks of addiction, and the duration of action of narcotic analgesics. Risks of addiction, desired levels of pain relief, and the frequency of administration of narcotic analgesics were assessed in the context of case studies to examine decision making. Subjects were also asked to list factors which contribute to the inadequate management of cancer pain. In addition, data related to age, gender, pain experiences, and number of cancer patients for whom the student had provided care were also collected. Number of years of nursing experience was also obtained from the post-RN baccalaureate students.

To establish face and content validity, the questionnaire was reviewed by content experts and then revised. The questionnaire was pretested with a group of nursing students who were similar in terms of educational preparation to those for whom the questionnaire was designed.

Reliability assessment was not carried out because it is not appropriate for this type of questionnaire. The questionnaire was intended to be used as a single, rather than repeated, measure of nursing students' knowledge and decisions. Observed differences in responses over time may be related to changes within the subject rather than problems with reliability.

Procedure

The investigator met with the students from one of the diploma programs, the basic baccalaureate, and the post-RN nursing programs during a regularly scheduled class to explain the purpose of the study and to invite participation. A research assistant introduced the study to the students from the diploma program with which the investigator is affiliated. A prepared script was utilized to introduce the study to ensure consistency of information presented. The script is found in Appendix C. Questionnaires were distributed to all students present in the classes and were completed at that time by those students wishing to participate in the study.

To reduce potential bias, the instructors responsible for each of the classes were not present in the class at the time of data collection. Completion of the questionnaire by students took approximately 10 to 15 minutes. Data collection was completed during the three week period from November 14, 1989 to December 4, 1989.

Design

This was a descriptive and comparative study in which a survey

approach was used.

Results

Characteristics of the Sample

Although it had been expected that there would be approximately 300 students available for the study, there were actually about 170 present in the classes (about 55% of all students enrolled in the four programs). Of the 170 questionnaires which were distributed, 164 were completed and returned. The response rate was 96%. There were 74 in Diploma Program A, 38 in Diploma Program B, 25 in the basic baccalaureate program (Program C), and 27 in the post-RN baccalaureate program (Program D). Of the participants, 148 (90.2%) were female and 13 (9.8%) were male. Three participants chose not to report gender.

For the post-RN baccalaureate nursing students, years of experience in nursing ranged from 0.5 to 30.0 years (mean=8.9 years, std dev=8.094). Table 1 summarizes the reported number of patients with cancer for whom the respondents had provided care. Many (58.5%, n=96) reported having provided care for 1 to 10 cancer patients. From a Chi square analysis, it was found that subjects from Program D (the post-RN baccalaureate students) had cared for significantly greater numbers of patients with cancer ($X^2=36.15$, $p \leq .05$, df=6). These findings are summarized in Table 2. Pearson correlation coefficients indicated that years of experience among post-RN baccalaureate students was significantly and positively related to the reported number of patients for whom care had been provided (Pearson r=.2215, p=.003).

Table 1

Reported Frequency of Number of Patients with Cancer for Whom the Subject had Provided Care

Number of patients	Frequency	Percentage
None	25	15.3
1-10 patients	96	58.5
11-30 patients	23	14.0
More than 30 patients	15	9.2
Missing cases	5	3.0

Table 2

Reported Number of Patients with Cancer for Whom the Subject had Provided Care by Program

Number of Patients	Program A	B	C	D	Total
None	9.0[a]	9.0	5.0	2.0	25.0
	11.06[b]	5.82	3.93	4.24	
1 - 10	48.0	22.0	18.0	8.0	96.0
	42.26	22.34	15.09	16.30	
More than 10	13.0	6.0	2.0	17.0	38.0
	16.72	8.84	5.97	6.45	
Total	70.0	37.0	25.0	27.0	159.0

Chi square=36.15; df=6; $p \leq .05$

[a] Observed frequency
[b] Expected frequency

Perceptions Related to Cancer Patients' Pain

On the average, subjects estimated that, for about 50% of cancer patients, pain is managed well with narcotic analgesics (Item 1 on the questionnaire). Estimates, across programs, ranged from 5% to 96% (mean=49.739%, std dev=24.287). There were significant differences across programs in estimates of the percentage of cancer patients for whom pain is well managed (Table 3: Anova, F=3.9256, p=.0099, df=3, 149). Estimated percentages of cancer pain thought to be managed well were significantly lower for subjects from Program A and Program D (Student-Newman-Keuls Procedure Q=16.6985, p=.05).

Using an 11-point scale, where 0 is no pain and 10 is worst pain possible, subjects were asked to identify the level of pain relief most terminally ill patients aim for when seeking relief of pain, the level of pain relief actually obtained, and the level of pain the subject would aim for when treating the pain of terminally ill cancer patients (Item 2). Mean scores were 3.439 (std dev=2.399) for the perceived aim of the patient and 5.323 (std dev=1.762) for the perceived level of pain relief obtained by the patient. The mean for reported aim of subjects was 2.098 (std dev=2.50). Significant relationships were found to exist between the perceived aim of the patient and the perceived level of relief obtained (Pearson r=.2739, p<.001) and between the perceived aim of the patient and the reported aim of the subjects (Pearson r=.6771, p<.001). In addition, a significant relationship was found between the subjects' beliefs about the percentage of cancer pain managed well with narcotic

Table 3

Subjects' Mean Estimation of Percentage of Cancer Patients' Pain Managed Well with Narcotic Analgesics by Program

Source	Degrees of Freedom	Mean Square	F	p
Between Groups	3	2189.185	3.9256	.0099
Error	149	557.664		
Total	152			

Program	n	Mean %	Std Dev	Std Error
A	68	42.6029	20.9649	2.5424
B	35	56.8571	22.4933	3.8021
C	26	56.4615	28.9996	5.6873
D	24	52.2917	25.8902	5.2848
Total	153	49.7386	24.2871	1.9635

analgesics and the level of pain relief patients are thought to obtain (Pearson r=-.3645, p<.001). No significant differences were found, with analysis of variance, among subjects from the four programs for the perceived level of pain relief aimed for by the patient, the perceived level of pain relief obtained by the patient, or the reported level of pain relief for which subjects aim.

Table 4 summarizes subjects' mean estimations of the percentage of cancer patients who exaggerate pain (mean=13.588%, std dev=11.104), report pain accurately (mean=56.500%, std dev=22.120), and minimize pain experienced (mean=29.941%, std dev=19.254) (Item 4). No significant differences in these estimations were found among subjects from the four programs (analysis of variance).

Knowledge Related to Narcotic Analgesics

Knowledge of the duration of action of common narcotic analgesics including Codeine, Demerol, Morphine, and MS Contin was assessed (Item 12). Correct responses for duration of action were considered to be 4-6 hours for intramuscular (IM) Codeine, 2-3 hours for intramuscular (IM) Demerol, 3-4 hours for intramuscular (IM) Morphine, and 11-12 hours for oral MS Contin. From 30 to 67 percent of the subjects' responses about the duration of action of Codeine, Demerol, and MS Contin were incorrect and about 25% of the responses were incorrect about Morphine. Approximately 10 to 18 percent of the subjects did not answer the item (Table 5). Thus, the hypothesis that nursing students will correctly identify the duration of action of common narcotic analgesics

Table 4

Estimations of Mean Percentage of Accuracy of Cancer Patients' Reports of Pain

Response[a]	Mean %	Std Dev	Std Error
Exaggerate pain	13.588	11.104	0.898
Report accurately	56.500	22.120	1.782
Minimize pain	29.941	19.254	1.557

[a] n=154 for each response

Table 5

Duration of Action of Specific Narcotic Analgesics: Correct and Incorrect Responses

	Responses			
Analgesic	Correct	Incorrect	Unanswered	Total
IM Codeine	33(20.1%)	111(67.7%)	20(12.2%)	164(100%)
IM Demerol	64(39.1%)	83(50.5%)	17(10.4%)	164(100%)
IM Morphine	103(62.9%)	42(25.5%)	19(11.6%)	164(100%)
MS Contin Oral	30(18.3%)	104(63.4%)	30(18.3%)	164(100%)

could not be supported (Hypothesis 2). With analysis of variance, no significant differences were found among subjects from the four programs in relation to knowledge of the duration of action of narcotic analgesics.

In addition to questions related to the duration of action, three questions were included about potential drug interactions of specific narcotic analgesics (Items 15 to 17). On a scale of 1 to 7, where 1 is very unlikely to occur and 7 is highly likely to occur, responses in the range of 6 to 7 were considered to be correct for each item. Table 6 summarizes the frequency of responses for each of these items. Of the subjects, 12.2%(n=20) were aware of the potentially toxic interaction of Demerol and MAO inhibitors, 27.5% (n=45) were aware of the beneficial effects of the concurrent administration of a specific narcotic analgesic, Morphine, with phenothiazines to reduce nausea, and 20.7%(n=34) were aware of the reduction in anxiety which may occur when tricyclic antidepressant are administered concurrently with specific narcotic analgesics. Thus, the hypothesis that nursing students will correctly identify potential drug interactions of common narcotic analgesics is not supported (Hypothesis 2). No significant differences were found among subjects from the four programs in knowledge of the potentially toxic interaction of Demerol and MAO inhibitors or the beneficial interactions of specific narcotic analgesics with phenothiazines and tricyclic antidepressants (analysis of variance).

A 7-point scale (where 1=very unlikely and 7=highly likely) was

Table 6

Frequency of Responses Related to Potential Drug Interactions

Analgesic	Frequency of Response[a]							
	Very unlikely 1	2	3	4	5	6	Highly Likely 7	Missing
MAO Inhibitors and Demerol	20	9	19	38	19	9	11	39
Phenothiazines and Morphine	20	14	13	20	27	27	18	25
Antidepressants and Narcotic Analgesics	21	17	18	29	24	20	14	21

[a] n=164

utilized to assess subjects' knowledge of the effect increased anxiety has on narcotic analgesic requirements (Item 3). A score of 7 stated the correct relationship. The mean score was 6.280 (std dev=1.236). Sixty percent of the subjects (n=99) responded that anxiety is highly likely to increase analgesic requirements for cancer patients in pain. With analysis of variance, no significant differences were found among subjects from the four programs in knowledge about the relationship between anxiety and analgesic requirements.

Subjects were also asked to use a 7-point scale (where 1 was very unlikely and 7 was very likely) to state the chances that a cancer patient would become addicted if given 100 mg Demerol IM on a routine basis (i.e., every 4 hours for 10 days) (Item 13). The same question was asked about 100 mg Demerol IM given every 4 hours prn (as required) for 10 days (Item 14). The correct response for each item was 1 (very unlikely to become addicted). Mean scores for likelihood of becoming addicted were 2.778 (std dev=1.838) for the patient given Demerol every four hours and 2.285 (std dev=1.697) for the patient given Demerol every four hours prn. Of the subjects, 37.2% (n=61) correctly stated that the patient was unlikely to become addicted if given 100 mg Demerol IM every 4 hours for 10 days and 48.8% (n=80) correctly stated that the patient was unlikely to become addicted if given 100 mg Demerol IM every 4 hours prn for 10 days. Table 7 summarizes the frequencies of responses for these two items. Beliefs regarding risks of addiction for prn and routine administration of Demerol were significantly and positively related

(Pearson r=.6876, p<.05). In addition to these findings, several students wrote comments in the margins of the questionnaire stating that patients with "real pain" will not become addicted to narcotic analgesics.

Inasmuch as the risk of addiction is known to be low for patients receiving narcotic analgesics in therapeutic dosage ranges, nursing students did not correctly identify the risks of addiction for cancer patients receiving narcotic analgesics in therapeutic dosage ranges. Thus, Hypothesis 1 is not supported.

Significant differences were found in terms of responses, by program, concerning knowledge of risks of addiction with routine and prn administration of therapeutic doses of Demerol to the patient with cancer (Table 8: Routine Administration: Anova, F=6.0445, p=.0006, df=3, 158; Table 9: PRN Administration: Anova, F=3.9791, p=.0092, df=3, 154). Post-hoc comparisons indicated that subjects from Program A and Program D rated the risks of addiction with routine administration significantly higher than subjects from Program B and Program C (Student-Newman-Keuls Procedure Q=1.2427, p=.05) and subjects from Program A and Program D rated the risks of addiction with prn administration significantly higher than subjects from Program B (Student-Newman-Keuls Procedure Q=1.1673, p=.05).

Participants rated the importance of preventing addiction for patients with cancer who are terminally ill and those who are not terminally ill, using a 7-point semantic differential scale (Items 8 and 11). A score of 1 was considered to be correct. Mean scores were 3.48 (std dev=1.988)

Table 7

Likelihood of Becoming Addicted with Routine and Prn Administration of 100 mg Demerol IM for 10 days

Administration		Frequency of Response[a]							
		Very Likely to Become Addicted						Highly unlikely to Become Addicted	
		1	2	3	4	5	6	7	Missing
Routine	(n)	61	26	19	23	16	11	6	2
	(%)	37.2	15.9	11.6	14.0	9.8	6.7	3.7	1.2
Prn	(n)	80	28	13	13	13	8	3	6
	(%)	48.8	17.1	7.9	7.9	7.9	4.9	1.8	3.7

[a] n=164

Table 8

Risks of Addiction with Routine Administration of Demerol: Mean Scores by Program

Source	Degrees of Freedom	Mean Square	F	p
Between Groups	3	18.6689	6.0445	.0006
Error	158	3.0886		
Total	161			

Program	n	Mean	Std Dev	Std Error
A	72	3.0972	1.9584	.2308
B	37	1.9459	1.3112	.2156
C	26	2.2692	1.2824	.2515
D	27	3.5556	2.0817	.4006
Total	162	2.7778	1.8382	.1444

Table 9

Risks of Addiction with PRN Administration of Demerol: Mean Scores by Program

Source	Degrees of Freedom	Mean Square	F	p
Between Groups	3	10.8433	3.9791	.0092
Error	154	2.7250		
Total	157			

Program	n	Mean	Std Dev	Std Error
A	69	2.4928	1.8521	.2230
B	36	1.6111	0.9033	.1505
C	26	2.0000	1.2329	.2418
D	27	2.9259	2.1470	.4132
Total	158	2.2848	1.6971	.1350

for importance of prevention of addiction during the first 10 days following abdominal surgery for a cancer patient who was not terminally ill and 1.677 (std dev=1.390) for the cancer patient who was terminally ill. No significant differences were found among subjects from the four programs in knowledge of the importance of preventing addiction, for either the cancer patient who was terminally ill or the cancer patient who was not (analysis of variance).

Decisions Related to the Administration of Narcotic Analgesics

Three case studies were included in the questionnaire to study decisions nursing students make regarding the administration of narcotic analgesics to cancer patients with pain. For a terminally ill cancer patient experiencing continuous severe pain and whose pain was not relieved by the previous dose of Morphine IM (Item 10), 17.5% (n=27) of the participants in this study reported that they would administer the same dose or a smaller dose of Morphine, despite an order permitting an increase in dosage. In a second case study, 18 to 22 % (n=31 and 33) reported that they would administer less than the previous dose of Demerol IM to a cancer patient who was not terminally ill (Items 6 and 7). The remaining subjects decided that they would administer the same dosage as was previously administered. Of the subjects administering less than the previous dosage of Demerol, 3.7%(n=6) stated that they would administer only half of the original dose. Eleven respondents (7%) provided a range of dosages rather than a specific dose of Morphine or Demerol to be administered and several wrote notes in the margins of

the questionnaire requesting additional data including sex, age, and weight of the patient. From a Chi square analysis, no significant differences were found regarding the dosage of Morphine or Demerol which would be administered, among subjects from the four programs. There were no significant differences in dosages selected in relation to the reported number of cancer patients for whom the subject had provided care (Chi square analysis).

In the selection of time intervals for the administration of Demerol, 10.9% (n=17) selected intervals which exceed the duration of action of Demerol. Pearson correlation coefficients indicated that the time interval selected for the administration of Demerol was not significantly related to subjects' knowledge of the duration of action of this drug. While a maximum of 8 doses of Demerol could be administered in a 24 hour period for the patient in the case study, 10% (n=15) of the subjects stated that they would administer 4 or fewer doses; whereas, only 42% (n=69) reported they would administer the maximum number of doses (mean=6.79, std dev=1.39). The number of doses of Demerol which the subjects decided would be administered in a 24 hour period was not found to be significantly related to knowledge of the duration of action of Demerol (Pearson correlation coefficients). No significant difference in the number of doses of Demerol which would be administered in a 24 hour period was found among subjects from the four programs (analysis of variance).

Almost all of the participants (90.7%; n=147) agreed that narcotic

analgesics should be given on a routine basis (at regular intervals around the clock) to a terminally ill cancer patient reporting continuous severe pain (Item 5). No significant difference was found regarding decisions about the routine administration of analgesics to terminally ill patients among subjects from the four programs, from a Chi square analysis. Further, no significant differences were found between beliefs about the routine administration of analgesics to terminally ill patients and the reported number of patients for whom care had been provided (Chi square analysis).

Beliefs about the routine administration of narcotic analgesics were found to be positively correlated with knowledge of risks of addiction arising from routine administration of narcotic analgesics (Pearson r=.1997, p=.006). Similarly, a positive correlation was found between beliefs about the routine administration of narcotic analgesics and the importance of preventing addiction for the terminally ill patient (Pearson r=.1660, p=.018). Therefore, hypothesis 3 was not supported.

Relationship Between Knowledge and Decisions

Overall scores for knowledge and decisions were computed for each subject. The total number of correct responses to items on the questionnaire related to knowledge and to decisions were calculated. Items pertaining to potential drug interactions, risks of addiction, and the duration of action of narcotic analgesics were included in the calculation of knowledge scores (Items 3, 8, and 11 to 17). Similarly, items concerning risks of addiction in specific situations, selection of dosages,

and time intervals for administration of narcotic analgesics were included in the calculation of decision scores (Items 5 to 7, 9, and 10).

Out of a possible 12 correct responses for knowledge, scores ranged from 0 to 9 (mean=4.226, std dev=2.146). Scores ranged from 3 to 10 for decisions made, out of a possible 11 correct responses (mean=8.354, std dev=1.799) (Appendix D). A weak but significant relationship was found between subjects' scores for knowledge and scores for decisions (Pearson r=.2176, p=.003).

Scores related to knowledge and decisions did not vary among subjects from the four programs. Chi square analysis indicated that nursing students from Programs A, B, and C did not demonstrate significantly higher scores than the post-RN baccalaureate nursing students from Program D. Thus, hypothesis 4 was not supported. In addition, no significant relationship was found between the reported number of patients with cancer for whom the subject had provided care and subjects' knowledge and decision scores. Therefore, hypothesis 5 was also not supported.

Perceived Influence of Past Experience

Subjects were asked to identify experiences with pain which influence their decisions about cancer pain management with narcotic analgesics. These are rank ordered and presented in Table 10. Included were personal experiences with acute or chronic pain, experiences of significant others or patients with acute or chronic pain, and experiences of significant others or patients with cancer pain (Item 20). Because

Table 10

Pain Experiences Identified by Subjects

Pain Experiences	Percentage[a]
Experiences with patients with acute pain	82.3 (n=135)
Experiences with patients with chronic pain	75.6 (n=124)
Experiences of patients with cancer pain	60.4 (n=99)
Personal experience with acute pain	56.1 (n=92)
Experiences of significant other with acute pain	43.3 (n=71)
Experiences of significant other with chronic pain	40.2 (n=66)
Experiences of significant other with cancer pain	20.1 (n=33)
Personal experience with chronic pain	17.7 (n=29)
Other experiences with pain	4.9 (n=8)

[a]n=161

subjects could identify up to nine pain experiences, the total n is greater than the sample size. The experiences most frequently identified were experiences of patients with acute and chronic pain. Experiences least frequently identified were those of a significant other with cancer pain and personal experience with chronic pain. No significant differences in pain experiences reported were found, with Chi square analysis, among subjects from the four programs.

Perceived Factors Influencing the Management of Cancer Pain

In an open ended question, subjects were asked to identify factors which they believe contribute to the inadequate management of cancer pain with narcotic analgesics (Item 1b). Responses were grouped into categories related to the patient, physician, nurse, disease, and analgesic(s) prescribed. Of the 164 subjects, 144 listed from 1 to 10 factors they believed to contribute to the inadequate management of cancer pain with narcotic analgesics. These are summarized in Table 11. The most frequent factors cited include emotional status of the patient; inappropriate selection of analgesic, dosages, and intervals for administration; inaccurate appraisal of patients' pain; lack of knowledge; and fear of addiction.

Discussion

It is evident from the findings of this study that the subjects lack knowledge about narcotic analgesics. This finding is evident, not only among the nursing students from Programs A, B, and C, but among post-RN baccalaureate nursing students as well. This suggests that

Table 11

Perceived Factors Contributing to the Inadequate Management of Cancer Pain with Narcotic Analgesics

Factors	Frequency
Related to the Patient	
Emotional factors including anxiety, fear, stress	36
Low pain tolerance	18
Influence of significant others	16
Patient does not ask/cannot ask/refuses analgesic	15
Perceptions about pain	13
Lack of knowledge	8
Fear of addiction	6
Demographic variables - age, sex, body size, ethnic/cultural background	7
Perceived lack of control in pain management	4
Fear of death	3
Related to the Physician	
Insufficient dosage ordered	21
Inappropriate analgesic ordered	9
Lack of knowledge	8
Inaccurate appraisal of patients' pain	7
Inappropriate route/ frequency of administration	6
Fear of addiction	5
Fear of side effects of analgesics	4
Related to the Nurse	
Intervals between doses too long	17
Inaccurate appraisal of patient's pain	14
Prn rather than routine administration of analgesics	9
Lack of knowledge	7
Insufficient dosage administered	7
Fear of addiction	6
Lack of adjunctive nursing interventions	6
Personal beliefs and attitudes	4
Lack of assessment	3
Fear of side effects of analgesics	2

Table 11 (Continued)

Perceived Factors Contributing to the Inadequate Management of Cancer Pain with Narcotic Analgesics

Factors	Frequency
Related to the Disease	
Extent of metastasis	14
Type of cancer	9
Breakthrough pain	2
Related to the Analgesic(s) Prescribed	
Development of tolerance	8
Allergic reactions, side effects	6
Differences in physiological responses to analgesics	5

knowledge of narcotic analgesics does not increase with experience in nursing or with experience caring for patients with cancer.

Not only do the subjects lack knowledge of the duration of action of common narcotic analgesics including Codeine, Demerol, Morphine, and MS Contin, but also knowledge of potential drug interactions and risks of addiction. Correct decisions were made in many cases regarding dosages and intervals for administration of the narcotic analgesics but these decisions were not based on sound knowledge. This suggests that decisions related to dosage and frequency of administration of narcotic analgesics are based on other things, such as perceived norms for administration, rather than accurate information. Further, the reluctance of some subjects to select a specific dosage to be administered, in a particular situation, suggests a possible lack of confidence in making decisions related to the management of cancer pain with narcotic analgesics.

In addition to the lack of knowledge about narcotic analgesics, lack of knowledge related to the risks of addiction with therapeutic doses of narcotic analgesics is evident among the subjects. Knowledge of the risks of addiction does not seem to improve with experience caring for cancer patients or with years of experience working as a nurse, as is suggested by the responses of the post-RN baccalaureate nursing students. Differences in knowledge related to risks of addiction for students from Program A and Program D may be related to differences in program content or clinical experiences.

Overall, subjects were less concerned with addiction for the cancer patient who is terminally ill as compared to the cancer patient who is not. This may account, at least in part, for the large percentage of subjects who reported support for the routine, rather than prn, administration of narcotic analgesics to terminally ill cancer patients. However, this support for routine administration is not evident in the time intervals for administration selected in other items on the questionnaire, nor is it consistent with findings of previous research which indicate that narcotic analgesics are not frequently administered on a routine basis in clinical settings. It is possible that attitudes toward routine administration of narcotic analgesics have become more positive, at least among this group of nursing students. However, it is also possible that these nursing students did not interpret the term "routine administration" to mean at regular intervals around the clock, whether or not the patient requests an analgesic.

Subjects estimated that, on average, for half of the patients suffering cancer pain, pain is not adequately managed with narcotic analgesics. Yet, many of the subjects believed that patients exaggerate pain and most would not aim for total relief of pain for the terminally ill cancer patient. While total relief of pain may not be a realistic goal for all terminally ill cancer patients, these findings suggest that subjects do not believe that patients report pain accurately and that subjects would accept less than total pain relief as an appropriate goal. By virtue of that acceptance, they may, in fact, contribute to inadequate pain management

for at least some cancer patients.

The number of nursing students who reported that they would continue to administer the same dose or a lesser dose of analgesic to patients whose pain was not relieved by the previous dose, is of concern. Current trends in cancer pain management suggest that, in cases of unrelieved pain, higher dosages of narcotic analgesics should be administered initially and, once the pain is controlled, dosages can be slowly decreased as long as adequate pain control is maintained. It is thought that continuing with the same or a lesser dose will extend, rather than decrease, the time that the patient suffers pain.

It was anticipated that the subjects, who were nursing students in the final stages of completion of a basic nursing program, would demonstrate greater knowledge and make better decisions than nurses with more experience in nursing. This was hypothesized because of the probable exposure of the students to recent advances in knowledge related to the management of cancer pain with narcotic analgesics. However, this hypothesis was not supported in this study. A number of explanations may account, at least in part, for this finding. First, it is possible that content related to recent advances in cancer pain management is not included or is poorly integrated in nursing curricula and, thus, poorly presented to students. In addition, opportunities to apply this information in clinical practice settings may be limited. Second, inaccurate information may be acquired by way of interactions with patients, faculty, nursing staff, and other health care providers and, subsequently be

utilized as an information base for making decisions about the management of cancer pain with narcotic analgesics.

Pain is a common phenomenon, not only among cancer patients, but among other patients as well. It could be assumed that nursing students, as well as graduate nurses, understand the concepts of pain management by virtue of having been exposed to a variety of patients with pain and having spent time dealing with this problem. This assumption is not supported by the findings of this study which indicate that knowledge and decisions related to the management of cancer pain with narcotic analgesics are not related to amount of experience in nursing or to amount of experience caring for patients with cancer. The time spent by these nursing students in the actual management of pain is unknown but actual time spent managing pain problems may be a more important factor in acquiring the knowledge required to effectively manage cancer pain in clinical settings than experience in nursing or experience caring for patients with cancer.

Limitations of the Study

A number of limitations are inherent in this study. This study provides a description of the knowledge and decisions of a small, nonrandom sample of nursing students from four nursing programs. However, differences may exist between this group of nursing students and the population from which the sample was selected which were not identified because of the number of students from each group who were not in class at the time of data collection. It can be suggested that the more

knowledgeable students attend class and were in class at the time of the study. If this is the case, knowledge and decision making competencies of the population as a whole would be overestimated in this study. In addition, written responses on the questionnaire cannot be used to predict decisions which would be made in actual clinical practice. Thus, the findings of this study cannot be generalized beyond the nursing students participating in this study and inferences cannot be made about the knowledge and decisions of nursing students from other programs or about nurses in clinical practice.

The use of a self-administered questionnaire, as the method of data collection, precludes the subject from seeking additional information which may be useful in answering the questions posed. In fact, several students wrote notes in the margins of the questionnaire seeking additional information or providing rationale for their responses. In many cases, the additional information requested was not required in making a decision but there was no way to determine why that information was deemed to be essential. Rationale for why this information was sought may have provided clues as to the information base nursing students utilize in making decisions about the administration of narcotic analgesics.

For questions which were unanswered or for which the response did not seem reasonable, the researcher was unable to encourage the subject to answer or seek clarification from the respondent. As a result, data were not obtained for all items from each subject.

The questionnaire itself requires some refinement. In a few cases where the response to an item did not seem reasonable, a question arose as to whether the item was worded in such a way that all students would interpret the item similarly and in the manner intended. For example, the term "routine" was intended to mean at regular intervals around the clock regardless of whether the patient requested analgesic or not. However, results of the study suggest that this may not, in fact, be the way in which this term was interpreted. Insertion of clear definitions of terms in the questionnaire would assist in preventing this problem.

Several questions required numerical responses. In some cases, subjects responded with a numerical range (e.g., 50-75 mg) rather than a single numerical response (e.g., 75 mg). In coding data for computer analysis, the range of response was averaged. As a result, important data may have been lost. For example, the selection of a range of doses rather than a specific dose may indicate uncertainty on the part of the subject. This information is not retrievable following coding for computer analysis unless the averaged score can be identified in the data set. Similar problems occurred in the coding of data from semantic differential scales where a range of numbers was selected to indicate the subject's response.

In an open-ended question, subjects were asked to identify factors contributing to ineffective management of cancer pain with narcotic analgesics. A note to the subjects to list these factors "by order of importance" would have provided a clearer indication of what the

subjects believed to be the most important contributing factors. Comparisons could then have been made to determine if differences existed among the groups in the factors identified and the importance attached to each factor.

The use of situational questions assumes that subjects will respond in a manner which reflects decisions which would be made in actual clinical practice. However, respondents are unable to seek additional cues required to make a decision and may respond in a manner which is perceived to be desirable. Other beliefs, values, and attitudes held may also influence the decisions made in clinical practice, as is suggested by the conceptual framework for this study. Thus, the generalizability of the findings of this study are limited and responses to items on the questionnaire cannot be used to predict actual clinical practice.

Implications

Nursing Practice

The lack of knowledge regarding narcotic analgesics is of concern, not only for the cancer patient with pain, but for other patients experiencing pain as well. Narcotic analgesics are commonly used in the management of acute and chronic pain. If nursing students' decisions are based on inaccurate information, then adequate management of pain is not likely to occur, regardless of the etiology of the pain.

Similarly, if decisions are based on perceived norms, as the results of this study suggest, and, if the student does not possess accurate information about narcotic analgesics, then no accurate referent exists by

which the appropriateness of the norm can be judged. As a result, decisions may be based on faulty norms and inappropriate administration of narcotic analgesics in the management of cancer pain may result.

Myths related to the risks of addiction to narcotic analgesics exist, even among senior nursing students. This irrational fear of addiction may result in the withholding of narcotic analgesics from cancer patients with pain and, subsequently, needless suffering. In addition, current media campaigns to reduce the abuse of street drugs may, in fact, reinforce this fear of addiction among nurses and patients to the detriment of effective cancer pain management. Thus, accurate information regarding the risks of addiction to narcotic analgesics is required to dispel these myths.

Nursing Education

It is evident from the findings of this, and other previous studies, that basic nursing education is not providing nursing students with the information required to effectively manage cancer pain with narcotic analgesics. An examination of curricular content and clinical practice is required to determine whether nursing students are provided with adequate opportunities to acquire the knowledge and decision making skills required for the effective management of cancer pain. Nursing faculty and students must be encouraged to utilize the findings of clinical research related to the management of cancer pain with narcotic analgesics to improve clinical practice.

The importance of providing students with accurate information regarding narcotic analgesics during their basic nursing education is supported by the findings that experience in nursing and experience caring for patients with cancer pain do not necessarily result in improved knowledge and clinical decisions. Thus, basic nursing education must assume responsibility for providing nursing students with opportunities to acquire the knowledge and skills required to effectively manage cancer pain with narcotic analgesics.

Nursing Research

The results of this study suggest a number of other studies which could be initiated. It is recommended that similar studies, utilizing large random samples of nursing students and nurses in clinical practice, be undertaken to provide a more generalizable description of knowledge and decisions make, not only in relation to the management of cancer pain, but pain of other etiology as well.

Research is required to assess the knowledge of nursing faculty related to pain in general, and more specifically cancer pain, and to examine the extent to which content concerning pain management is included in nursing curricula. Factors contributing to a lack of accurate information about narcotic analgesics among nursing students need to be identified so that appropriate strategies can be developed to deal with this problem.

While the nursing students in this study made some correct decisions regarding dosages and frequency of administration of narcotic

analgesics, it is evident that these decisions often are not based on accurate information about specific narcotic analgesics. Further research is required to examine the process by which nurses and nursing students make decisions and the information base utilized in making decisions about the administration of narcotic analgesics, not only in the management of cancer pain, but with pain of other etiology as well.

Summary

In this study, most of the nursing students surveyed were unable to correctly identify the risks of addiction for cancer patients receiving narcotic analgesics in therapeutic dosage ranges or potential drug interactions of narcotic analgesics. In addition, many were unable to correctly state the duration of action of common narcotic analgesics including Codeine, Demerol, Morphine, and MS Contin.

No significant relationship was found between nursing students' decisions related to the administration of narcotic analgesics and their knowledge regarding potential drug interactions, the risks of addiction, and duration of action of narcotic analgesics. Overall knowledge and decision scores did not vary between diploma, basic baccalaureate, and post-RN baccalaureate nursing students. No significant relationship was found between overall knowledge and decision scores and reported number of cancer patients for whom the nursing students had provided care. Thus, none of the hypotheses tested were supported by the findings of this study.

Conclusion

There is little doubt that the nursing students studied lack in knowledge of narcotic analgesics and that decisions made regarding the administration of narcotic analgesics in the management of cancer pain are not based on accurate knowledge. The findings of this study suggest that essential content and clinical experiences may be lacking in current curricula related to the management of cancer pain with narcotic analgesics. These findings are consistent with those of other similar studies and have implications for the planning of basic nursing curricula as well as continuing education programs related to the management of cancer pain.

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Appendix A

Cancer Pain: A Review of the Literature

Pain is one of the most common fears faced by the patient with cancer. While not all patients with cancer experience pain, for those who do, inadequate pain control is a common problem. Results of several studies suggest that a number of factors may contribute to this problem. The purpose of this appendix is to present an overview of various theories of pain, and of factors thought to influence pain. In addition, literature related to the etiology and incidence of cancer pain and to factors which may influence the management of cancer pain is reviewed.

Theories of Pain

Historically, pain has been viewed either as a physical sensation or a psychological phenomenon. Until recently, two major pain theories had been proposed. The pattern theory held that pain occurs with any kind of excessive stimulation, be it touch, heat, or cold, while the specificity theory stated that specific nerve endings and pathways exist for specific sensations including pain. These theories have since been challenged because they do not adequately explain some clinical pain phenomena (Melzack & Wall, 1965).

The gate control theory of pain was introduced by Melzack and Wall (1965) as a response to the short-comings of other theories. According to this theory, pain impulses can be modulated or altered in the spinal cord, brain stem, and cerebral cortex and may result in heightened or diminished pain perception regardless of the intensity of the noxious

stimuli. Psychological and physiological factors may influence pain perception and response by acting on the gate control system. Thus, the gate control theory of pain holds that cognitive-evaluative and motivation-affective factors interact with sensory phenomena to produce pain. Although some of the physiological bases of the gate control theory have been challenged, this conceptualization of pain offers plausible explanations for some clinical pain phenomena, such as referred pain, and the influence of psychological factors, such as anxiety, on the pain experience, for which prior theories have not been able to account (Melzack & Wall, 1965).

Factors Influencing Pain

Several factors including pain threshold, pain tolerance, age, gender, culture, and psychological factors are thought to influence pain.

Pain Threshold and Pain Tolerance

In experimental research, pain sensitivity has been studied from the perspectives of pain threshold and pain tolerance. By definition, pain threshold is the stimulus level at which the subject first recognizes pain; whereas, pain tolerance is that level at which the subject requests that the stimulus cease (Woodrow, Friedman, Siegelaub, & Collen, 1972). Conflicting results have been reported regarding the relationship between pain threshold and pain tolerance. Clark and Bindra (1956) reported a high correlation between pain threshold and pain tolerance while, in contrast, the findings of Benjamin (1958), Gelfand (1964), and Merskey and Spear (1967) indicated that pain threshold and pain

tolerance are probably not highly related. Gelfand (1964) suggested that pain threshold is more dependent on physiological factors and pain tolerance upon psychological factors.

Age

The findings of studies related to the relationship between age and pain are contradictory. Several studies have shown that pain sensitivity decreases and pain tolerance increases with age (Chapman & Jones, 1944; Procacci, Bozza, Buzzelli, & Corte, 1984; Schludermann & Zubek, 1962; Sherman & Robillard, 1960, 1964). However, in contrast to these studies, other studies have shown that pain tolerance decreases with age (Collins & Stone, 1966; Woodrow et al.,1972). Woodrow et al. (1972) suggest that the contradictions demonstrated may be the result of differences in the means used to measure pain tolerance in experimental research. When pain tolerance is measured using radiant heat, it increases with age. However, when pain tolerance is measured using pressure on the Achilles tendon, it decreases with age. Thus, the research suggests that tolerance to cutaneous pain increases with age and tolerance to deep pain decreases. If correct, these conclusions may have important implications for the management of pain in the elderly.

In studies of cancer pain, no significant differences were found in patients' perceived pain intensity (Bressler, Hange, & McGuire, 1986; McGuire, 1984) or between groups of patients reporting pain and those reporting no pain with respect to age (Dorrepaal, Aaronson, & van Dam, 1989).

Gender.

Differences exist in the findings of studies related to gender and pain threshold. While several studies have reported that the threshold for men is higher than for women (Kennard, 1952; Sherman & Robillard, 1960, 1964), others have not found significant gender differences in pain threshold (Hardy, Wolff, & Goodell, 1952; Notermans & Tophoff, 1984).

In measuring pain tolerance, it has been consistently reported that men tolerate more pain than women in experimental situations (Hardy et al., 1952; Notermans & Tophoff, 1984; Petrie, 1960; Woodrow et al., 1972) and that pain tolerance varies less among women than men (Woodrow et al., 1972). A possible explanation for these findings is a process of socialization whereby women may report pain in a research setting while men may be more inclined to deny pain incurred.

Most of the studies cited utilized experimental designs to examine the influence of pain threshold, pain tolerance, age, and gender on pain. However, subjects may respond differently to clinical pain and, therefore, the findings of experimental pain research may not be generalizable to clinical pain. In studies of cancer pain, no significant gender differences were found in the intensity of pain reported by patients (Bressler et al., 1986; McGuire, 1984)

Culture

Several studies have shown that significant differences exist among ethnic groups in the response to and expression of pain (Chapman & Jones, 1944; Lipton & Marbach, 1984; Sherman & Robillard, 1960;

Sternback & Tursky, 1965; Zborowski, 1952, 1969). However, variability in response to and expression of pain may also be observed within ethnic groups (Lipton & Marbach, 1984; Winsberg & Greenlick, 1967). While cultural differences exist, Chapman (1984) suggests that they are likely differences in expressiveness rather than differences in sensory experience. This is supported by the findings of studies which indicate that no significant differences exist in pain intensity reported by patients with respect to ethnic group (Bressler et al., 1986; McGuire, 1984).

This area of research is not without methodological weaknesses. One of the major problems is the lack of consistent definitions of ethnic groupings. As a result, it is difficult to determine the specific ethnic group studied. Factors which may influence illness and pain behavior, such as the degree of acculturation and socioeconomic status of the ethnic group, have not been consistently reported. In addition, few studies have quantitatively compared different ethnic groups along similar aspects of the pain experience (Lipton & Marbach, 1984). Thus, generalizability of the findings of these studies is limited.

Psychological Factors

Many studies have shown that psychological factors may influence the pain experience. Beecher (1956) was one of the earliest researchers to report that pain is influenced by factors such as anxiety and the meaning of the pain experience for the individual. The pain experienced by an individual may be amplified by emotions such as anger, fear, anxiety, and depression, and, conversely, can often be reduced by interventions .

such as distraction, relaxation, imagery, and medication which act to diminish these factors (Craig, 1984). In the management of chronic pain, such as that of cancer, prevention of the cyclic recurrence of pain and the anxiety related to the anticipation of pain is thought to enhance analgesic effectiveness (Charap, 1978; Fox, 1982; McGuire & Yarbo, 1987).

Cancer Pain: Etiology and Incidence

For many patients, the onset of cancer pain is insidious. The pain may involve several sites (Twycross & Fairfield, 1982). Often, acute exacerbations of pain are superimposed on chronic pain (Foley, 1982). Determining the etiology and incidence of cancer pain is difficult because of the complexity of the cancer pain experience.

Etiology

The pain experienced by cancer patients may arise from the presence of the cancer in pain-sensitive structures, the cancer therapy, or problems unrelated to the cancer or its treatment (Ahles, Ruckdeschel, & Blanchard, 1984; Coyle, 1985). Clinically, it may be difficult to differentiate cancer pain from non-cancer pain (Ahles et al., 1984), but understanding the etiology is necessary for the long-term management of cancer pain (Coyle, 1985).

Foley (1982) noted that, of pain problems reported by cancer patients: 78% were associated with direct tumor involvement; 19% were reported during the course of or as a result of surgery, chemotherapy, or radiation therapy; and 3% of the reports of pain were unrelated to the cancer or cancer therapy. Similarly, Ahles et al. (1984) found that 66% of the pain

reported by cancer patients was directly related to the cancer, 13% resulted from cancer related surgical procedures, and 21% of the pain experienced was not related to the cancer or cancer therapy. In a comparison of patients with metastatic and nonmetastatic cancer, it was found that more than 56% of patients with metastatic cancer experienced pain related to their cancer as compared to 17% with nonmetastatic cancer. Additionally, 6-7% of all the patients studied suffered pain unrelated to their cancer (Daut & Cleeland, 1982).

Incidence

The reported incidence of pain among cancer patients varies from study to study. Bonica (1979) noted that no data exist from large-scale epidemiological studies on the incidence and severity of cancer pain. However, the literature suggests that moderate to severe pain will be experienced by about a third of cancer patients in intermediate stages of the disease and by 60 to 90% of the patients in advanced stages (Benedict, 1989; Donovan & Dillon, 1987; Dorrepaal et al., 1989; Foley, 1979; Lipman, 1980; Oster, Vizel, & Turgeon, 1978; Rankin, 1982; Twycross, 1974). While pain is a frequently reported symptom, as many as 50% of cancer patients will not experience significant pain (Ahles, Blanchard, & Ruckdeschel, 1983; Anderson, 1982; Coyle, 1985; Oster et al., 1978; Spiegel & Bloom, 1983; Turnbull, 1971, 1979).

Several problems are encountered when a comparison the findings of studies related to the etiology and incidence of cancer pain is attempted. While some of the samples represent homogeneous groups in terms of

the type of cancer involved (Benedict, 1989; Turnbull, 1971, 1979), others do not (Dorrepaal et al., 1989; Foley, 1979; Twycross, 1974). Several studies have found that the incidence of cancer pain varies across diagnostic categories and that cancer pain is most commonly associated with the presence of metastatic disease and, in particular, bone metastasis (Ahles et al., 1984; Bonica, 1982; Daut & Cleeland, 1982; Foley, 1982; Oster et al., 1978; Spiegel & Bloom, 1983; Twycross & Fairfield, 1982). In addition, the samples studied were selected from the populations of institutions providing varying types of services including acute, palliative, and outpatient care. As a result, the samples are not comparable and the findings reported may not reflect the incidence of cancer pain in the general population.

A second problem occurs from the use of retrospective chart analysis to determine the degree of pain experienced by patients (Oster et al., 1978; Turnbull, 1971, 1979). Several studies have demonstrated low correspondence between physician and nurse ratings of patients' pain and patients' self-reports of pain and between physician and nurse ratings of patients' pain and the amount of analgesic administered (Camp & O'Sullivan, 1987; Cohen, 1980; Graffam, 1981; Pilowsky, Manzcap, & Bond, 1969; Teske, Daut, & Cleeland, 1983). Thus, retrospective chart analysis may not provide an accurate picture of the incidence of cancer patients' pain.

In addition to the problems associated with retrospective chart analysis, several problems are inherent in using patients' self-reports of

pain to determine the incidence of cancer pain. Although Spiegel and Bloom (1983) found that the amount of pain reported was significantly related to the reported use of analgesics in a sample of outpatients with metastatic breast cancer, Reading (1983) notes that self-reports of pain may be subject to response bias or falsification. In fact, patients may not accurately report their pain fearing that the pain may be an indicator of a worsening of their condition (Ahles et al., 1983; Spiegel & Bloom, 1983).

Management of Cancer Pain

The pain suffered by cancer patients often has serious negative physical and psychological consequences. Some of the problems reported by patients include a reduction in activity level, increased prevalence of sleep disorders, fatigue, anorexia, anxiety, depression, loneliness, and decreased concentration (Ahles et al., 1983; Bressler et al., 1986; Cleeland, 1984; Donovan & Dillon, 1987; Dorrepaal et al., 1989; Rankin, 1982). There is little argument that cancer patients experience pain; yet, little is known about why this problem persists despite recent advances in the management of cancer pain.

Various nonpharmaceutical interventions including surgical procedures, radiation, nerve blocks, acupuncture, transcutaneous electrical nerve stimulation, biofeedback, relaxation and imagery, and hypnosis have been described in the literature as being effective in the management of cancer pain (Anderson, 1982; Coyle, 1985; McCaffery, 1979; McGuire & Yarbo, 1987). However, research suggests that these modalities are not commonly utilized (Bruera, Fox, Chadwick, Brenneis,

& MacDonald, 1987; Dorrepaal et al., 1989).

More commonly, narcotic analgesics, nonsteroidal anti-inflammatory drugs, and adjuvant analgesic drugs are utilized in the management of cancer pain. Of these, narcotic analgesics are most commonly used to treat moderate to severe cancer pain (Coyle, 1985; McGuire & Yarbo, 1987). However, despite potential efficacy of narcotic analgesics in the management of cancer pain, evidence exists in the literature that 20 to 50% of the pain of cancer patients is inadequately managed with these drugs (Bonica, 1979; Dorrepaal et al., 1989).

Factors contributing to the inadequate management of cancer pain with narcotic analgesics include the underprescription of narcotic analgesics by physicians (Dorrepaal et al., 1989; Marks & Sachar, 1973); prescription of inappropriate analgesics (Dorrepaal et al., 1989); administration of narcotics less frequently than permitted by the physician's order (Cohen, 1980; Marks & Sachar, 1973; Rankin & Snider, 1984); administration of narcotics at intervals exceeding the duration of action of the drug (Charap, 1978; Fox, 1982; Marks & Sachar, 1973; Rankin, 1982); the prn (as required) rather than routine administration of analgesics (Bruera et al., 1987; Charap, 1978; Fox, 1982; Myers, 1985); fears of addiction, respiratory depression, and sedation (Charap, 1978; Dorrepaal et al., 1989; Donovan, 1989; Fox, 1982; Marks & Sachar, 1973; Rankin & Snider, 1984; Watt-Watson, 1987; Weis, Sriwatanakul, Alloza, Weintraub, & Lasagna, 1983); and a lack of recognition of potential drug interactions, both beneficial and harmful, of narcotics with

other medications (Charap, 1978; Fox, 1982; Marks & Sachar, 1973; Rankin, 1982). Many of these factors can be attributed to the failure of physicians and nurses to apply basic pharmacologic knowledge about narcotic analgesics. In addition, the administration of narcotic analgesics is related, at least in part, to nurses' inferences of patients' pain experiences and suffering.

Nurses' Inferences of Pain and Suffering

Several factors have been investigated related to nurses' inferences of pain and suffering. Some of these include nurse-patient ratings of pain, form of expression of pain, type of pain, gender, age, stage of illness, ethnicity and socioeconomic status, and nurses' educational preparation.

Nurse-patient Ratings of Pain

Using nonparticipant observation and interview techniques, Graffam (1981) studied the congruence of nurse-patient expectations regarding the management of pain. Congruence was found in nurse-patient expectations of the occurrence and severity of pain, but significant disparity was found in nurse-patient ratings of pain. In cases where there was disagreement regarding the severity of pain, 80% of the patients judged the pain to be more severe both initially and following pain relief measures. Nurses' documentation of assessment of pain was found to be minimal and the administration of a medication was the single relief measure used, in 99% of the cases.

Camp and O'Sullivan (1987) found that nurses documented significantly less than 50% of the pain described by the patients and

that nonverbal indicators were not frequently addressed in the documentation. Similarly, Fox (1982) found virtually no documentation of pain assessments in the medical records of cancer patients. Because of the nature of these studies, it is not possible to determine whether nurses simply failed to document their pain assessments or failed to assess and document patients' pain. However, Watt-Watson (1987) found that only 3% of a sample of graduate and student nurses reported using a standard approach in the assessment of patients' pain suggesting that inadequate assessment may well be the cause of the lack of documentation.

Teske et al. (1983) studied the relationships between nurses' observations and patients' self-reports of pain. While nurse raters were able to agree on the existence of nonverbal pain behaviors, there was low correspondence between their judgements of pain based on nonverbal behaviors and patients' self-reports of pain. Discrepancies between nurses' and patients' ratings of pain were greater in the chronic pain sample than in the acute pain sample. These researchers suggest that this is consistent with some nurses' beliefs that chronic pain patients exaggerate pain. The results also suggest that, as pain becomes chronic, patients display less intense nonverbal behaviors relative to their experienced pain (Teske et al., 1983).

Form of Expression of Pain

Teske et al. (1983) suggest that, if nurses rely only on assessment of nonverbal pain behaviors, patients may be undertreated with analgesics

because nurses tend to infer less physical pain in response to nonverbal as compared to verbal behaviors of the patient (Baer, Davitz, & Lieb, 1970; Cohen, 1980; Lenburg, Glass, & Davitz, 1970). This is supported by the findings of von Baeyer, Johnson, and McMillan (1984) who studied the effects of high and low levels of nonverbal expressions of pain on nursing students' ratings of patients' pain and distress. High nonverbal expressiveness resulted in significantly higher ratings of patient pain and distress. However, nonverbal expressiveness had no significant effect on psychological support or nursing interventions recommended for the patient.

Type of Pain

Taylor, Skelton, and Butcher (1984) studied how features of chronic and acute pain influence nurses' estimates of patient suffering, pain relief actions, and attitudes toward patients. Patients having no sign of pathology and chronic pain were rated, by nurses, as having less intense pain. When signs of pathology were negative, nurses gave low priority to the administration of pain medication and patients were attributed with more negative personality and behavioral traits. These findings are similar to those of Strauss, Fagerhaugh, and Glaser (1974) who noted that patients with atypical pain trajectories tend to be labelled as uncooperative or difficult, and support the findings of Burgess (1980) and Lenburg et al. (1970) who found that nurses attributed significantly less suffering to patients with chronic pain as compared to acute pain. Burgess (1980) found that nurses were willing to provide fewer pain relief

measures for chronic than acute pain patients, particularly if the patient was also described as being young. Taylor et al. (1984) note that negative stereotyping of young patients with chronic low back pain may account for at least part of the findings of Burgess (1980).

Gender

Studies related to the influence of gender of the patient on nurses' inferences of suffering have produced conflicting results. Although some researchers have found no gender differences in inferred pain (Davitz & Pendleton, 1969; Oberst, 1978), Martin and Belcher (1986) found that nurses inferred more pain for male patients. This supports the findings of Cohen (1980) that nurses administer less analgesia to female patients compared to males. However, Mason (1981) found that male and female patients were rated as having the same degree of psychological distress but that female patients were rated as having greater physical pain.

Age

Seemingly conflicting findings have been reported related to patients' age and nurses' inferences of suffering. While nurses were found to infer greatest suffering for the very young and the very old in several studies (Davitz & Pendleton, 1969; Martin & Belcher, 1986; Mason, 1981; Oberst, 1978), Dudley and Holm (1984) found no significant differences in inferences of suffering related to age. In each of these studies, the acuity of patient illness varied. This may explain, in part, the differences noted related to patients' age and inferences of suffering, and lend support to the suggestion of Oberst (1978) that an interaction of acuity of illness and

patient age influences the degree to which a patient is believed to suffer.

Stage of Illness

Lenburg et al. (1970) studied nurses' inferences of physical pain and psychological distress in relation to stage of illness and found that the early phase of illness is believed to involve greater pain and psychological distress. Further, inferences of suffering were found to depend on the patient's diagnosis (Davitz & Pendleton, 1969; Dudley & Holm, 1984).

Ethnicity and Socioeconomic Status

Findings from several studies suggest that significant differences exist between ethnic groups in the response to and expression of pain (Lipton & Marbach, 1984; Zborowski, 1952, 1969). In addition, the ethnic background of the patient may influence nurses' inferences of suffering (Davitz & Davitz, 1975).

Davitz, Sameshima, and Davitz (1976) studied the effects of nurses' cultural background on inferences of patients' suffering and found that nurses from Japan, Korea, Puerto Rico, Taiwan, Thailand, and the United States differed in their overall ratings of patients' physical pain and psychological distress. Similarly, Davitz and Pendleton (1969) found significant differences among American white, American Negro, and Puerto Rican nurses in their ratings of patients' suffering and Martin and Belcher (1986) found significant differences, between African and American nurses, in their inferences of suffering. Differences in the educational preparation of the subjects and the small samples used in

these studies limit the generalizability of their findings.

In one study, researchers found that significantly less suffering was inferred, by nurses, for upper class patients as compared to middle or lower classes (Davitz & Pendleton, 1969). In another study, nurses of lower socioeconomic status were found to infer more suffering than nurses of higher status (Oberst, 1978). These findings related to ethnicity and socioeconomic status suggest that inferences of suffering are related to the learned behavioral responses of a given culture or subculture.

Nurses' Educational Preparation

Lenburg, Burnside, and Davitz (1970) studied the relationship between length of time in a nursing education program and nurses' inferences about suffering. Both first and second year students consistently inferred greater degrees of psychological distress than physical pain. First year students inferred greater intensity of physical pain while second year students inferred greater intensity of psychological distress. The results suggest that students' inferences of suffering change as a result of educational experiences. This is similar to the findings of von Baeyer et al (1984) who reported that student nurses' ratings of patient distress, based on levels of nonverbal expressiveness, were inversely related to amount of nursing experience. Similarly, Mason (1981) found that graduate nurses with lesser amounts of experience inferred the greatest degree of physical suffering. No significant differences have been found in inferences of suffering of graduate nurses as related to level of educational preparation (Dudley &

Holm, 1984; Mason, 1981; Oberst, 1978), or nurses' inferences of suffering and area of specialization (Davitz & Pendleton, 1969; Dudley & Holm, 1984; Oberst, 1978).

The literature suggests that several factors may influence nurses' inferences of suffering but research in this area has been fragmented and few replication studies have been reported. In addition, the use of small sample sizes, nonrandom selection of subjects, and a lack of reporting of the reliability and validity of instruments used in many of the studies limits the generalizability of the findings obtained.

In several of the studies reviewed, the influence of a single variable on nurses' inferences of suffering was examined. While statistically significant results were found in some cases, an examination of the interaction of several variables which are thought to influence nurses' inferences of suffering may be what is required to develop more comprehensive and potentially useful theories regarding the influence of specific factors on nurses' inferences of suffering (Oberst, 1978).

Most of the studies reviewed used clinical vignettes as a data source. The use of vignettes assumes that the responses obtained are similar to those which would occur in actual clinical situations. However, in clinical settings, subjects would have the opportunity to verify clues and seek additional data. With the use of vignettes, this is not possible. Thus, the generalizability of the findings of these studies is limited. While nonparticipant observation may provide additional information about the manner in which nurses make inferences about patient suffering, direct

observation may alter responses affecting the reliability and validity of data obtained.

Summary and Conclusions

There is little doubt that many patients with cancer suffer pain; yet, the actual incidence of pain among cancer patients is unknown. Results of several studies suggest that nurses' and patients' ratings of pain often differ significantly and that the pain of cancer patients is not well managed despite recent advances in the management of cancer pain.

One of the problems in the management of cancer pain is the undertreatment of pain with narcotic analgesics; yet, little is understood about why this problem exists. While the administration of narcotic analgesics is related in part to the inferences nurses make regarding patients' pain, results of studies designed to identify factors influencing nurses' inferences of suffering are inconclusive. Further investigation is required to identify these factors and their influence on the selection of pain management strategies.

It has been suggested that, while nurses' attitudes and knowledge deficits contribute to inadequate control of cancer pain, education is the key to improving the management of cancer pain. Thus, nurses' knowledge and attitudes and the manner in which they contribute to adequate pain management warrant investigation so that appropriate educational strategies can be developed to ameliorate this problem. In addition, studies are required to determine the relationship of education

to long-term changes in knowledge, attitudes, and the clinical practice of nurses in the management of cancer pain.

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Appendix B

Cancer Pain Management Survey

The first several questions deal with the management of cancer pain with narcotic analgesics. Although you may not be currently providing care for patients with cancer pain, please answer the questions as though you were.

1. What percentage of terminally ill cancer patients' pain is managed well with narcotic analgesics?

   ___ % of terminally ill cancer patients' pain is managed well with narcotic analgesics

   b) Consider those patients for whom cancer pain is not well managed with narcotic analgesics. What factors do you believe contribute to this problem? Please comment in the space provided below.

   _____
   _____
   _____

2. Suppose that all human pain can be measured on a 10-point scale, where 0 is no pain and 10 is worst pain possible.

   a) What level of pain relief do you think that most terminally ill cancer patients typically aim for when seeking relief from pain?

   No Pain 1 2 3 4 5 6 7 8 9 10 Worst Pain

   b) What level of pain relief do you think that most terminally ill cancer patients actually obtain?

   No Pain 1 2 3 4 5 6 7 8 9 10 Worst Pain

   c) What level of pain would you aim for when treating the pain of terminally ill cancer patients?

   No Pain 1 2 3 4 5 6 7 8 9 10 Worst Pain

3. Cancer patients in pain are also frequently very anxious. How likely or unlikely is it that this anxiety will increase analgesic requirements?

   Very Unlikely 1 2 3 4 5 6 7 Highly Likely

4. Some patients exaggerate the amount of pain that they have, some patients report their pain accurately and some patients minimize their pain. What percentage of cancer patients fit in each of these categories?

   ___% exaggerate their pain
   ___% report their pain accurately
   ___% minimize their pain

5. A terminally ill patient with known bone metastasis has just been admitted to the unit. The patient reports continuous severe pain with periodic episodes of extremely severe pain. The physician has ordered Morphine 7.5 to 15 mg IM.

   Do you think that the Morphine should be given to this patient routinely (at regular intervals around the clock) or on a prn basis?

   __ Routinely

   Which of the following intervals do you feel is most appropriate for this patient?
   Select one.
   __ Every 2-3 hours.
   __ Every 3-4 hours.
   __ Every 4 hours.
   __ Every 4-6 hours.

   __ PRN

   Which of the following intervals do you feel is most appropriate for this patient?
   Select one.
   __ Every 2-3 hours prn.
   __ Every 3-4 hours prn.
   __ Every 4 hours prn.
   __ Every 4-6 hours prn.

QUESTIONS 6 TO 8 REFER TO THE FOLLOWING SITUATION. PLEASE READ THE SITUATION AND THEN ANSWER THE QUESTIONS.

Following abdominal surgery, a patient is diagnosed as having bowel cancer. The patient is not terminally ill and the prognosis for recovery is good. There were no post-operative complications. On the first post-operative day, the patient reports severe abdominal pain related to the surgery. An order has been written for Demerol 50-100 mg IM q 3-6h prn. The patient last received 100 mg Demerol at 1200h.

6. It is now 1500h. The patient reports severe abdominal pain. Would you give this patient some Demerol or no Demerol?

___Some Demerol	___ No Demerol
⬇	⬇
How much Demerol	⬇
would you give? ____ mg.	⬇
⬇	⬇
⬇	⬇

7. This patient continues to have pain.

   a) When would you feel comfortable giving the next dose of Demerol? Please specify in the space provided.

   I would administer the next dose of Demerol at ____ hours.

   b) How much Demerol would you administer? ____ mg.

   Assuming that you continue to administer this dosage of Demerol, how many doses of Demerol would you feel comfortable administering to this patient in a 24 hour period? ____ doses

8. The Demerol continues to be administered. How important or unimportant is it to implement measures to prevent addiction to Demerol during the first 10 days post-op for this patient who is not terminally ill?

   Not Important 1 2 3 4 5 6 7 Very Important

QUESTIONS 9 TO 11 REFER TO THE FOLLOWING SITUATION. PLEASE READ THE SITUATION AND THEN ANSWER THE QUESTIONS.

The physician's order for a terminally ill cancer patient with severe continuous pain reads Morphine 7.5 to 15 mg IM q 2-4h prn. The nurse administered Morphine 10 mg at 0800h. The patient obtained little relief from pain. At 1100h, she was given Morphine 10 mg.

9. For the Morphine given at 1100h, do you think that the nurse should have given this drug at an earlier time, a later time or at the time that it was administered (i.e., 1100)?

__ Earlier time __ Later time __ At the time given

⬇ ⬇ ⬇

At what time would you have ⬇

given this drug? ____ h ⬇

10. At l100h should the nurse have administered a smaller dose, a larger dose, or the 10 mg of Morphine that was administered?

__ Smaller dose __ Larger dose __ The 10 mg dose

⬇ ⬇ ⬇

How much Morphine would you ⬇

have administered? ___ mg. ⬇

11. The Morphine continues to be administered. How important or unimportant is it to implement measures to prevent addiction to Morphine for this terminally ill patient?

Not Important 1 2 3 4 5 6 7 Very Important

QUESTIONS 12 TO 17 ARE NOT RELATED TO THE ABOVE SITUATIONS.

12. How long is the analgesic effect of each of the following drugs?

Intramuscular Codeine:	____ hours
Intramuscular Demerol:	____ hours
Intramuscular Morphine:	____ hours
Oral MS Contin:	____ hours

13. What would the chances be that a cancer patient would become addicted if given 100 mg Demerol IM **every** 4 hours for 10 days?

Very unlikely to become addicted 1 2 3 4 5 6 7 Very likely to become addicted

14. What would the chances be that a cancer patient would become addicted if given 100mg Demerol IM q4h **prn** for 10 days?

Very unlikely to become addicted 1 2 3 4 5 6 7 Very likely to become addicted

15. Consider that Demerol has been ordered for a cancer patient who is taking a MAO inhibitor drug such as phenelzine (Nardil). How likely or unlikely is it that a toxic interaction would occur?

Very Unlikely 1 2 3 4 5 6 7 Highly Likely

16. A cancer patient becomes nauseated following each dose of Morphine. How likely or unlikely is it that the administration of a phenothiazine such as chlorpromazine (Largactil) along with the Morphine will prevent this nausea?

Very Unlikely 1 2 3 4 5 6 7 Highly Likely

17. A terminally ill cancer patient in pain may also be very anxious. How likely or unlikely is it that the patient's analgesic requirements will decrease if a tricyclic antidepressant such as desipramine (Norpramin) is administered along with a narcotic analgesic?

Very Unlikely 1 2 3 4 5 6 7 Highly Likely

THE FOLLOWING QUESTIONS ARE ABOUT YOU.

18. I am: ___ Female ___ Male

19. Have you ever provided nursing care to patients with cancer?

___ No
___ Yes. If yes, for approximately how many have you provided care?
___ None
___ A few (1 -10 cancer patients)
___ Quite a few (11-30 cancer patients)
___ A large number (More than 30 cancer patients)

20. Suppose that acute pain is defined as pain which lasts less than three months and chronic pain as pain which lasts more than three months.

Which of the following experiences with pain have you had which influence your decisions about cancer pain management with narcotic analgesics? Please indicate all responses which apply.

___ Personal experience with acute pain
___ Personal experience with chronic pain
___ Experiences of significant other with acute pain
___ Experiences of significant other with chronic pain
___ Experiences with patients with acute pain
___ Experiences with patients with chronic pain
___ Experiences of significant other with cancer pain
___ Experiences with patients with cancer pain
___ Other. Please specify. _____

22. Are there other questions related to cancer pain management that have not been asked in this questionnaire that you would like to comment on?

_____
_____

23. In which of the following nursing programs are you currently enrolled?

___ Diploma
___ Basic baccalaureate
___ Post-RN baccalaureate

If you are a diploma or basic baccalaureate student, then you may STOP here. Thank you very much for your participation in this study.

If you are a Post-RN baccalaureate student please answer the following question.

24. How many years of experience do you have working as a nurse? (For example, a nurse who graduated in 1982 and worked all of 1982,1983, and 1984 and worked half of 1989 would have worked 3.5 years.)

___ years of experience

Thank you very much for your participation in this study.

Appendix C

Script for Introduction of the Cancer Pain Management Survey

As a student in the Master of Nursing program at the University of Alberta, I have chosen the management of cancer pain as the topic for my thesis. Cancer pain management is an important aspect of nursing but relatively little is known about nursing students' understanding and views related to the management of cancer pain with narcotic analgesics. The purpose of this study is to collect data regarding nursing students' knowledge and decisions related to the management of cancer pain with narcotic analgesics.

I would appreciate your taking 10 to 15 minutes to complete this questionnaire. Although you may not be currently providing care for patients with cancer pain, please answer the questions as though you were. You do not need to answer all of the questions, if you do not wish to, but I hope that you will. If you choose not to complete this questionnaire, it will in no way affect your standing in your nursing program. Students not wishing to participate may either remain in their seats or leave the class and return once all the completed questionnaires have been collected.

Please do not sign the questionnaire. This will ensure the anonymity of all students participating in the survey. Only my thesis chairperson and I will have access to the completed questionnaires. All completed questionnaires will be stored in a locked cabinet and will be destroyed following data analysis. Results of the study will be made available through the Faculty of Nursing, University of Alberta and the Alberta Association of Registered Nurses' library.

If you have any questions about the questionnaire, please feel free to call me.

Thank you in advance for your participation in this study.

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Appendix D

Correct Responses for Knowledge and Decision Items on Questionnaire

Knowledge Items

Item	Correct Response	References
3	7	Craig, 1984; Fox, 1982
8	1	Marks & Sachar, 1973; Porter & Jick, 1980; Twycross, 1984
11	1	Marks & Sachar, 1973; Porter & Jick, 1980; Twycross, 1984
12	IM Codeine: 4-6h IM Demerol: 2-3h IM Morphine: 3-4h Oral MS Contin: 11-12h	Marks & Sachar, 1973: Pagliaro & Pagliaro, 1986[1]; Twycross, 1984
13	1	Marks & Sachar, 1973; Porter & Jick, 1980; Twycross, 1984
14	1	Marks & Sachar, 1973; Porter & Jick, 1980; Twycross, 1984
15	6, 7	Charap, 1978; Fox, 1982; Marks & Sachar, 1973; Rankin, 1982
16	6, 7	Charap, 1978; Fox, 1982; Marks & Sachar, 1973; Rankin, 1982
17	6, 7	Charap, 1978; Fox, 1982; Rankin, 1982

Decision Items

Item	Correct Response	References
5	Routinely	Bruera, Fox, Chadwick, Brennis, & MacDonald, 1987
	Every 2-3 hours or Every 3-4 hours	Charap, 1978; Fox, 1982; Pagliaro & Pagliaro, 1986[1]; Twycross, 1975
6	Some Demerol 100mg	Charap, 1978; Fox, 1982; Marks & Sachar, 1973; Pagliaro & Pagliaro, 1986[1]; Twycross, 1975
7	1800h 100mg 7, 8 doses	Charap, 1978; Fox, 1982; Marks & Sachar, 1973; Pagliaro & Pagliaro, 1986[1]; Twycross, 1975
9	Earlier 1000h	Charap, 1978; Fox, 1982; Marks & Sachar, 1973; Pagliaro & Pagliaro, 1986[1]; Twycross, 1975
10	Larger dose 15.0mg	Charap, 1978; Fox, 1982; Pagliaro & Pagliaro, 1986[1]; Twycross, 1975

[1]Pagliaro, A. M., & Pagliaro, L. A. (1986). Pharmacologic aspects of nursing. Toronto: Mosby.